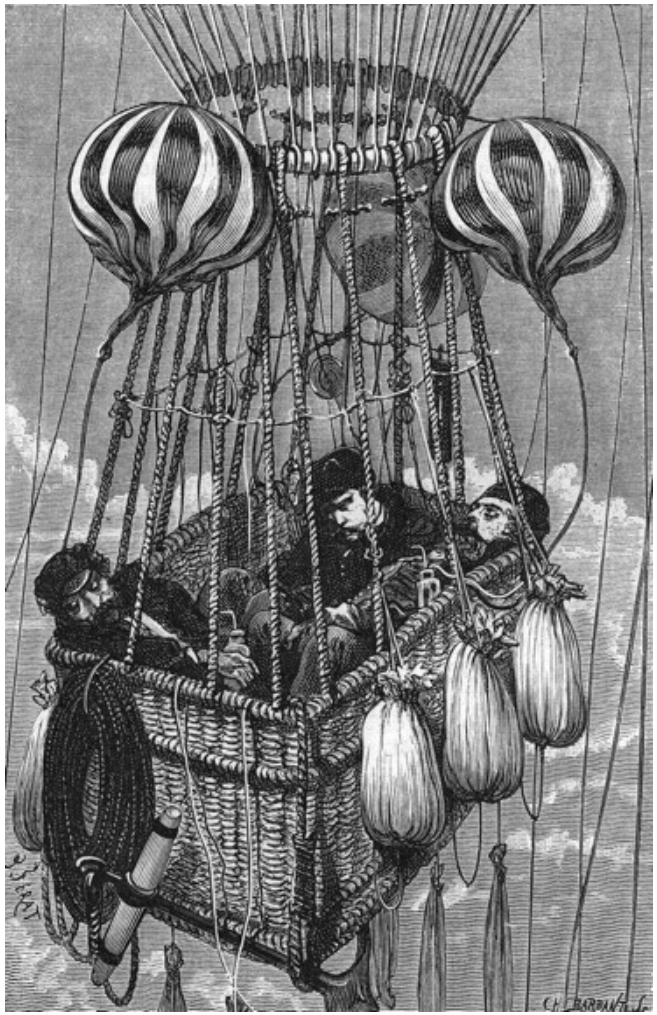
Rear Adm. Roy “Trigger” Kelley
Chief of Naval Air Training

Early Aviation, Pre-Wright Brothers



Paul Bert
Father of Aviation Medicine

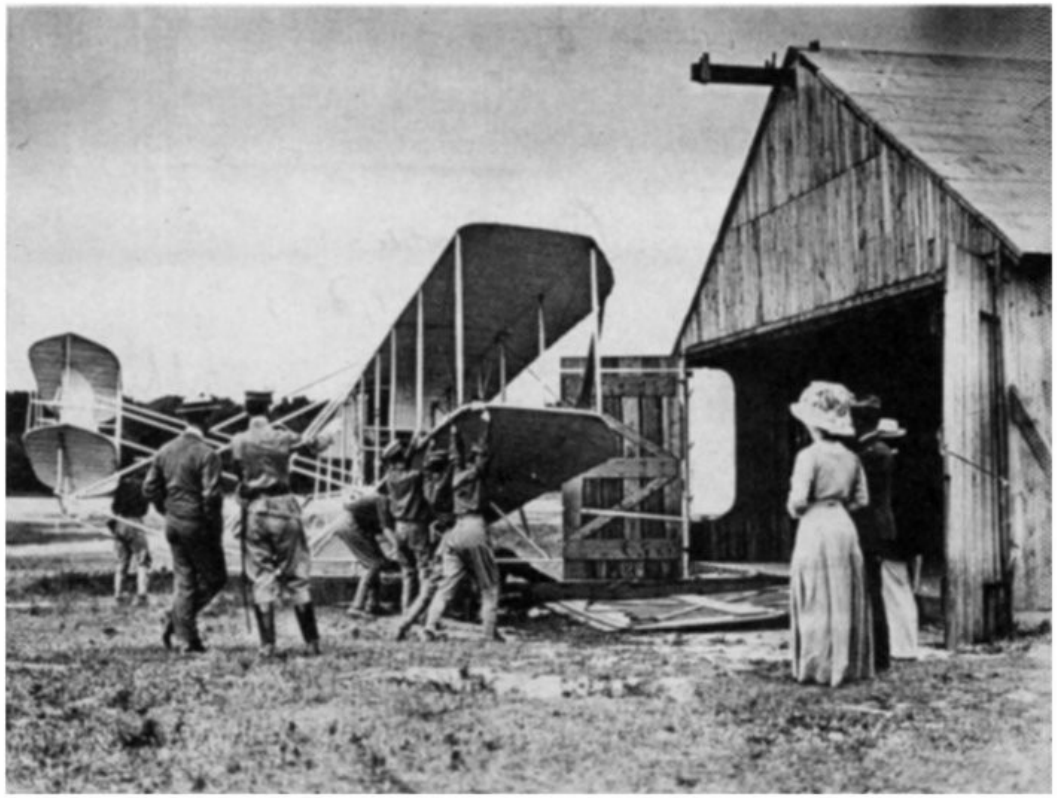
1901-1910
Heavier-than-Air Flight

1st Lt. Thomas Selfridge, USA
First military aviation casualty
1908

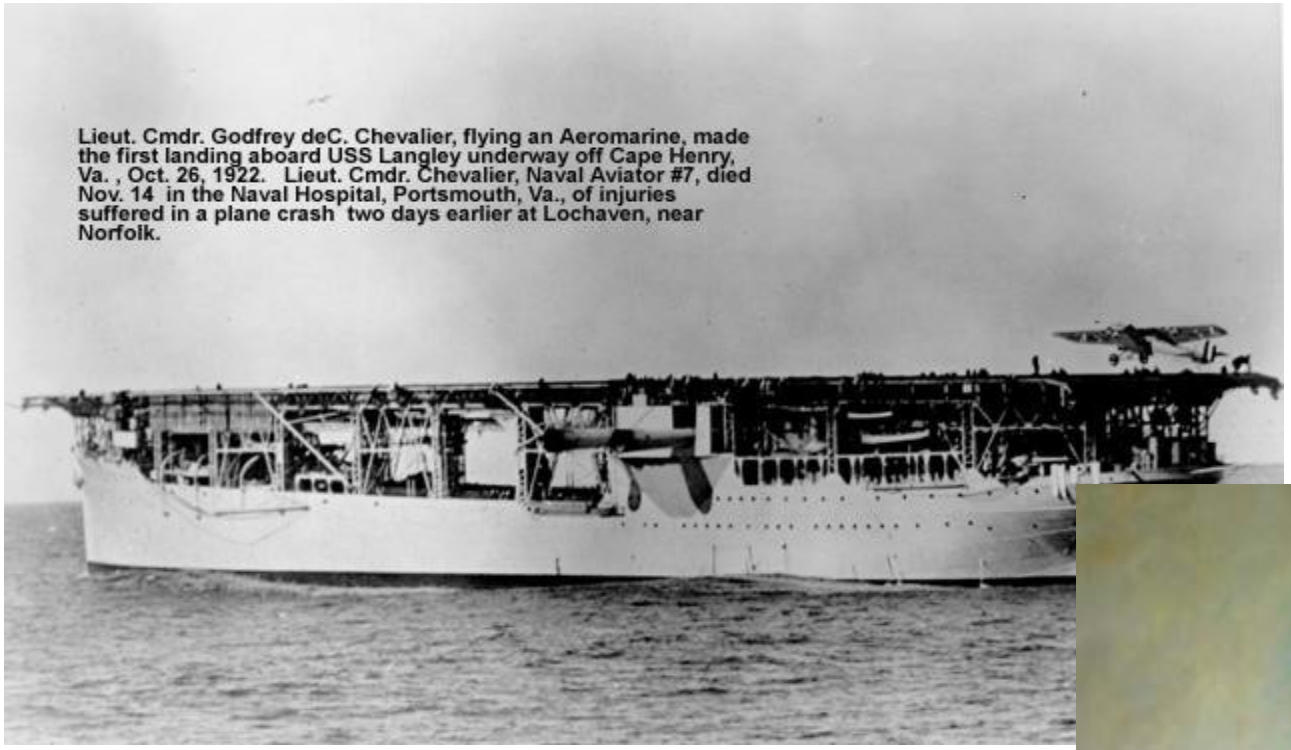
1910-1920
World War I

Alfred Cunningham, USMC

First use of aircraft during wartime



1920-1930
Inter-War Years

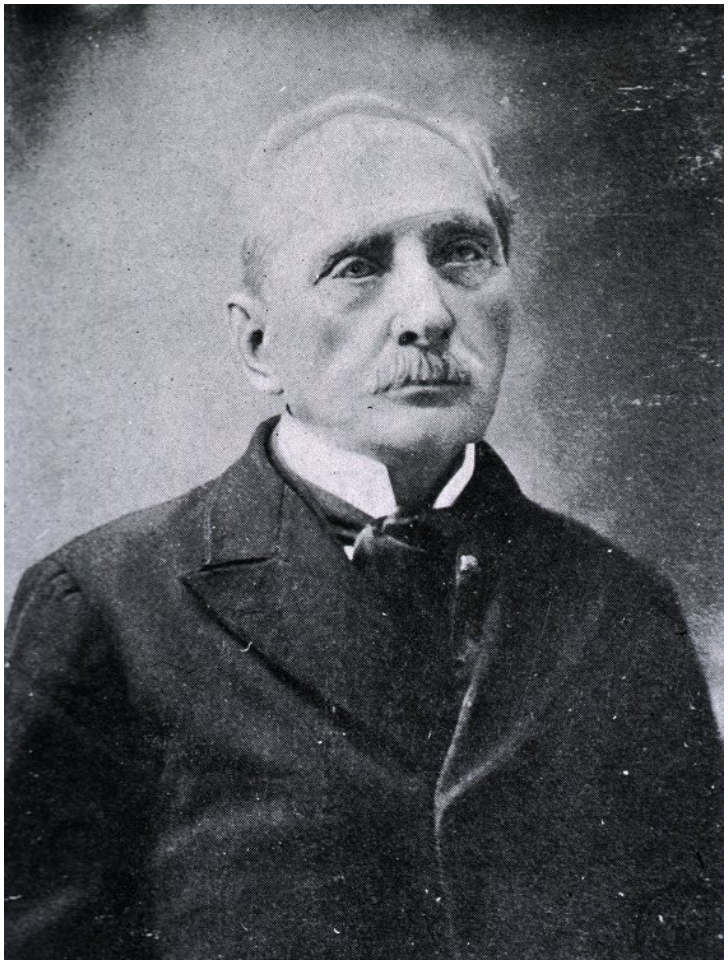

Lieut. Cmdr. Godfrey deC. Chevalier, flying an Aeromarine, made the first landing aboard USS Langley underway off Cape Henry, Va. , Oct. 26, 1922. Lieut. Cmdr. Chevalier, Naval Aviator #7, died Nov. 14 in the Naval Hospital, Portsmouth, Va., of injuries suffered in a plane crash two days earlier at Lochaven, near Norfolk.

The introduction of the Aircraft Carrier

The first military Flight Surgeon

Brig. Gen. Theodore C. Lyster, M.D. (1875-1933)

1920-1940
Inter-War Years



Dr. Louis Bauer
Army School of Aviation Medicine

Establishment of Civilian Bloodbanks

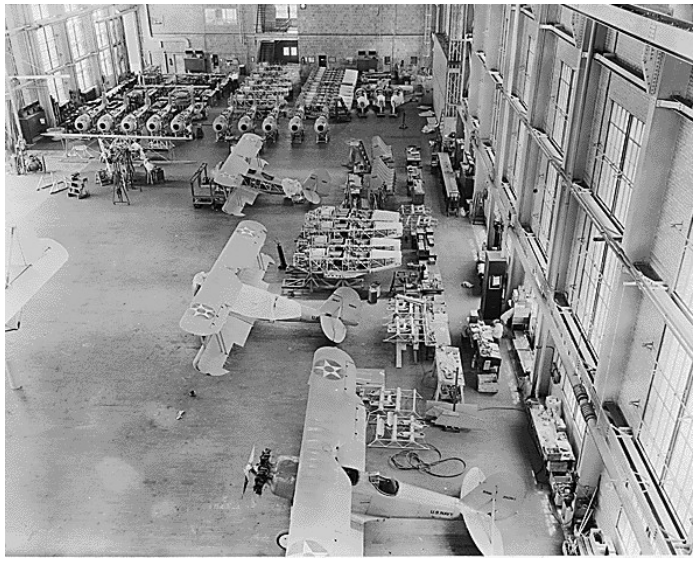
1940-1950
World War II

US Coast Guard PBM Mariner preparing for a SAR call during WWII

General Henry Arnold Commanding General of the U.S. Army Air Forces

1940-1950
World War II

Navy N3N flown in the film



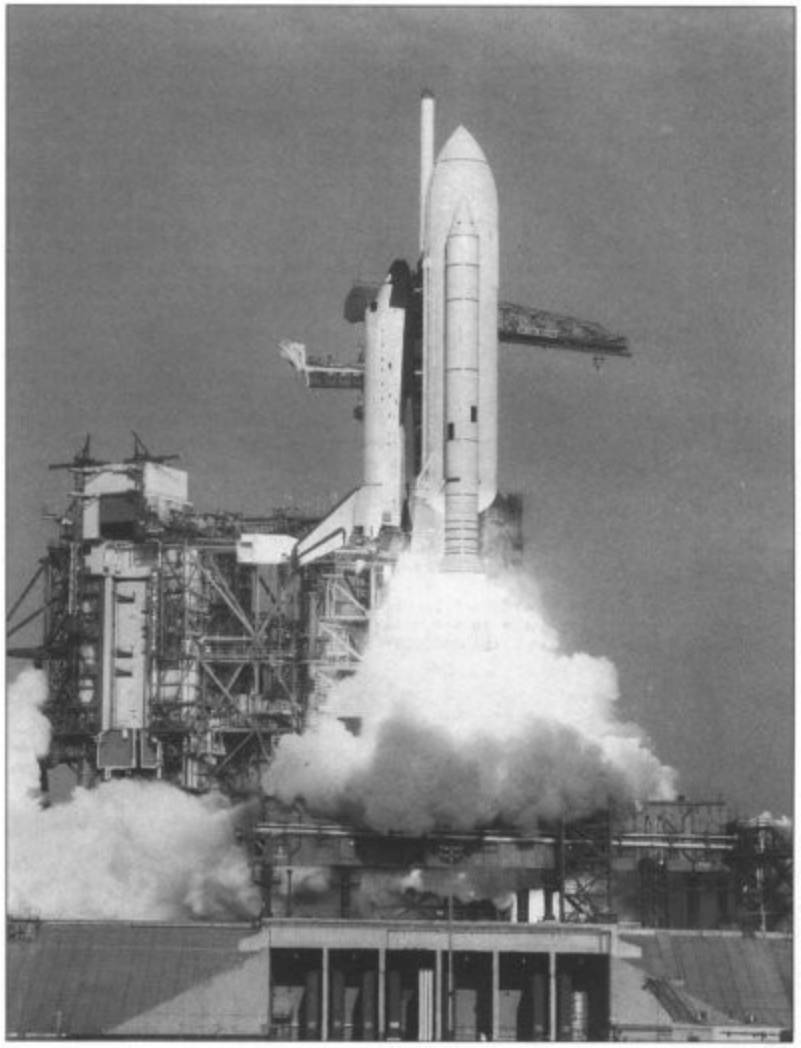
1950-
Post World War Years

FIGURE 50.—Mild thoracic exercises 7–14 days after operation (*2*).

Army Air Forces medical contributions:
1.Early Ambulation
2.Physical Rehabilitation

FIGURE 173.—Continued. C. Rehabilitation in a station hospital ward.

Pre-Cold War Years



Space Shuttle Columbia on its first launch

X-1, first aircraft to break sound barrier

Operation Enduring Freedom

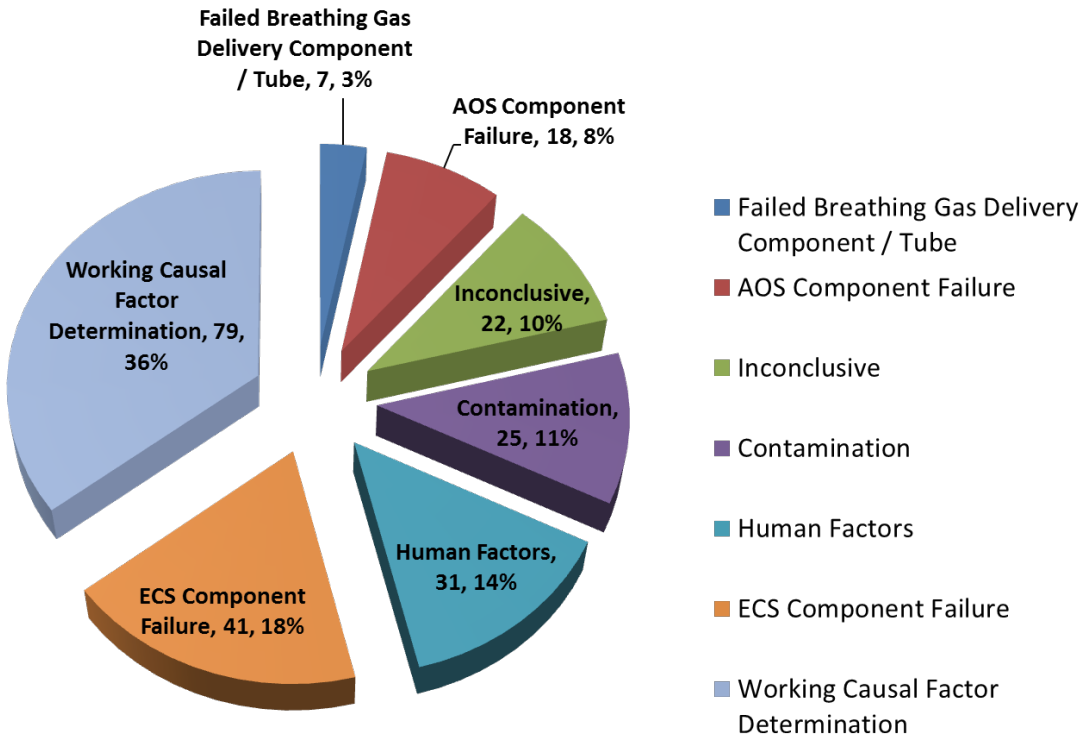
Arabian Gulf (Dec. 31, 2001) - Aviation Boatswain's Mate 3rd Class Krystol Koos directs a F-14B Tomcat assigned to the Diamondbacks of Fighter Squadron One Zero Two (VF-102) to the bow catapults aboard USS Theodore Roosevelt (CVN 71). VF-102 is deployed with the Theodore Roosevelt Carrier Strike Group (CSG) and is currently operating in the Arabian Sea in support of Operation Enduring Freedom (OEF). U.S. Navy photo by Photographer's Mate 2nd Class Jason Scarborough.

Operation Enduring Freedom (Aug. 8, 2002) -- An F-14 "Tomcat" assigned to the "Jolly Rogers" of Fighter Squadron One Zero Three (VF-103) conducts a mission over Afghanistan in support of Operation Enduring Freedom. The Grumman F-14 Tomcat is a supersonic, twin-engine, variable sweep wing, two-place strike fighter. The Tomcats primary missions are air superiority, fleet air defense and precision strike against ground targets. U.S. Navy photo by Capt. Dana Potts.

F/A-18 Events

- F/A-18
  - Formalized in 2010
  - Membership
    - Safety center
    - AIRLANT
    - AIRPAC
    - CNATRA
    - AIR 4.6 Human Systems
    - AIR 4.1.6 Systems Safety
    - AIR 4.3 Structures
    - PMA 265
    - PMA 202
    - Boeing
  - POC: F/A-18 Class Desk

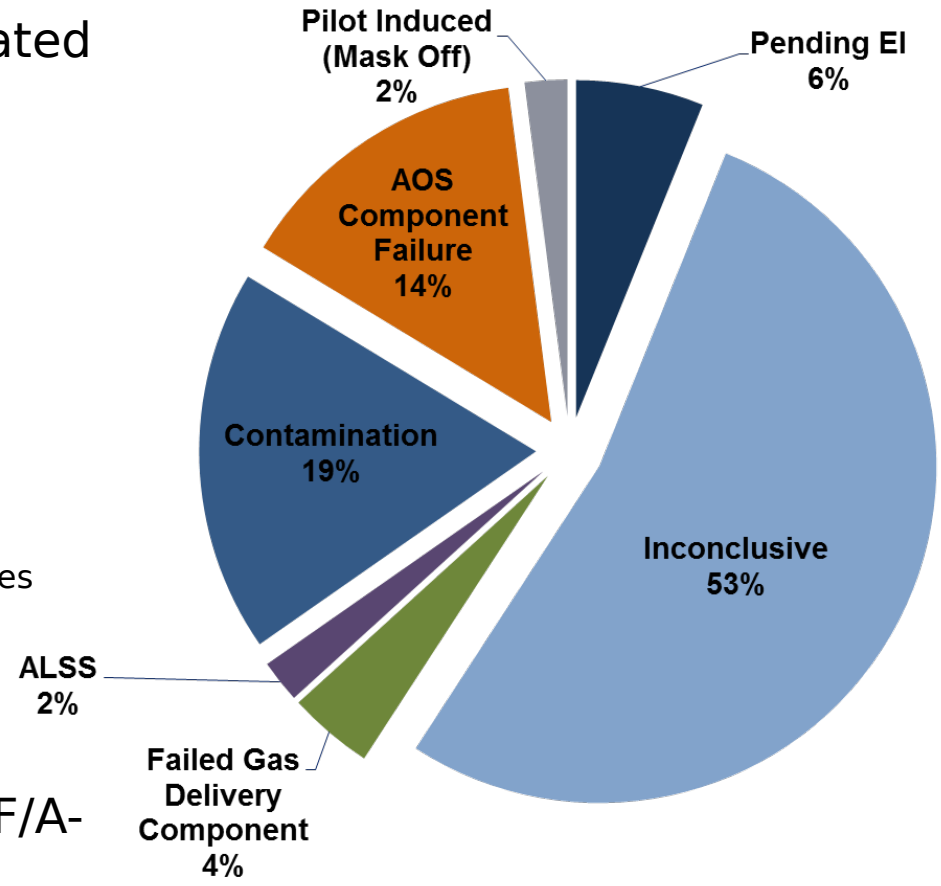
- F/A-18 PET Event Reporting


Failed Breathing Gas Delivery Component / Tube, 7, 3%
AOS Component Failure, 18, 8%
Inconclusive, 22, 10%
Contamination, 25, 11%
Human Factors, 31, 14%
ECS Component Failure, 41, 18%
Working Causal Factor Determination, 79, 36%
Failed Breathing Gas Delivery Component / Tube
AOS Component Failure
Inconclusive
Contamination
Human Factors
ECS Component Failure
Working Causal Factor Determination

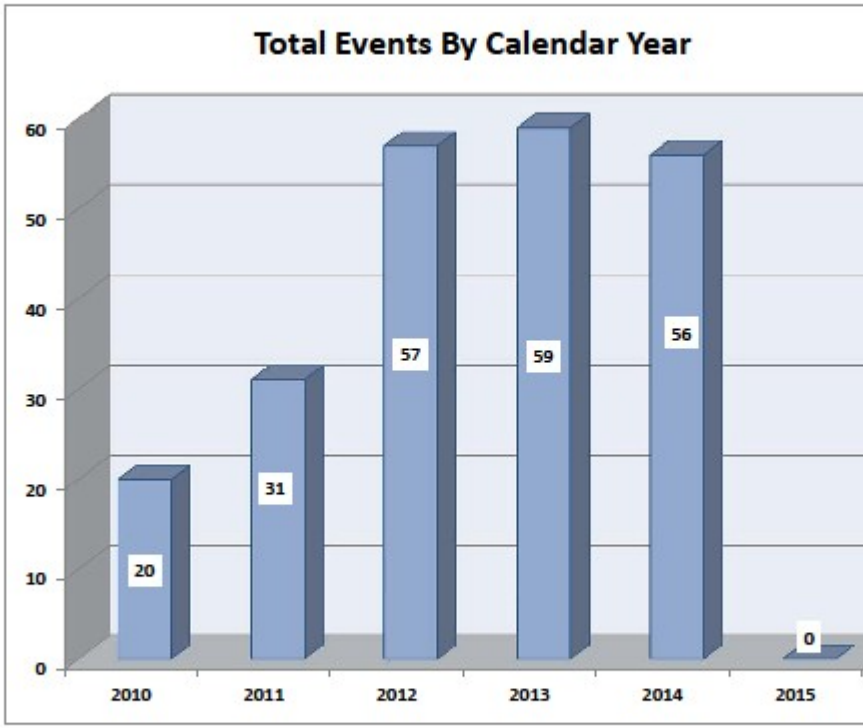
T-45 Events

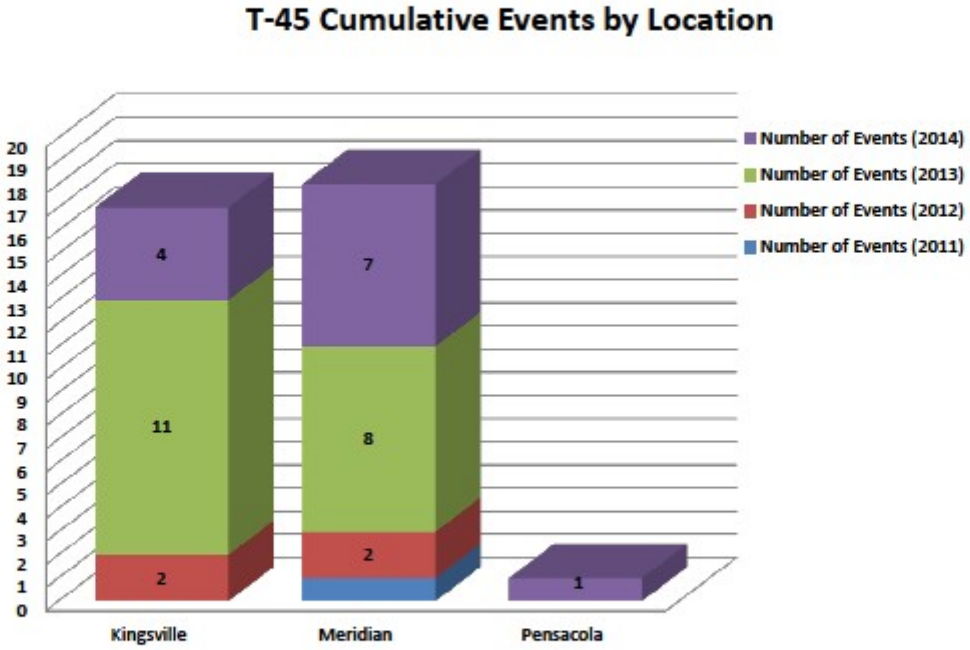
- T-45
  - Data collection process Initiated in 2012
    - Modeled after F/A-18 protocol
    - Events recorded, tracked, trended
    - Not as mature in analysis
  - OBOGS Working Group Established
    - Focused on key system contributing to overall PHYSEP problem
  - Membership
    - PMA-202 Oxygen Systems ISST (includes AIR-4.6 personnel)
    - T-45 Subsystems FST
    - T-45 System Safety
    - Lead: T-45 Class Desk by Default
  - Processes less mature than F/A-18

- T-45 Reporting

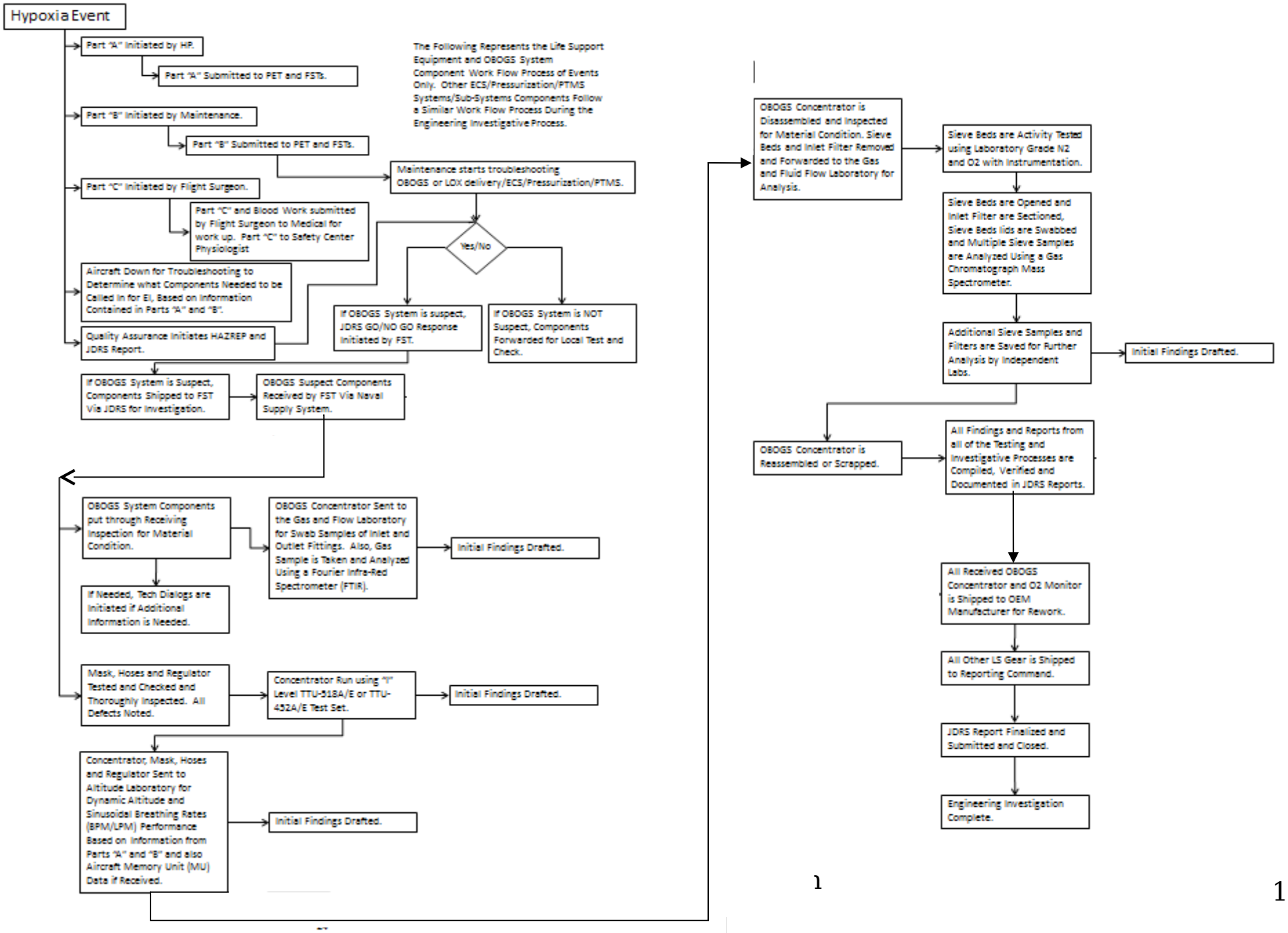


F/A-18 & T-45 Events





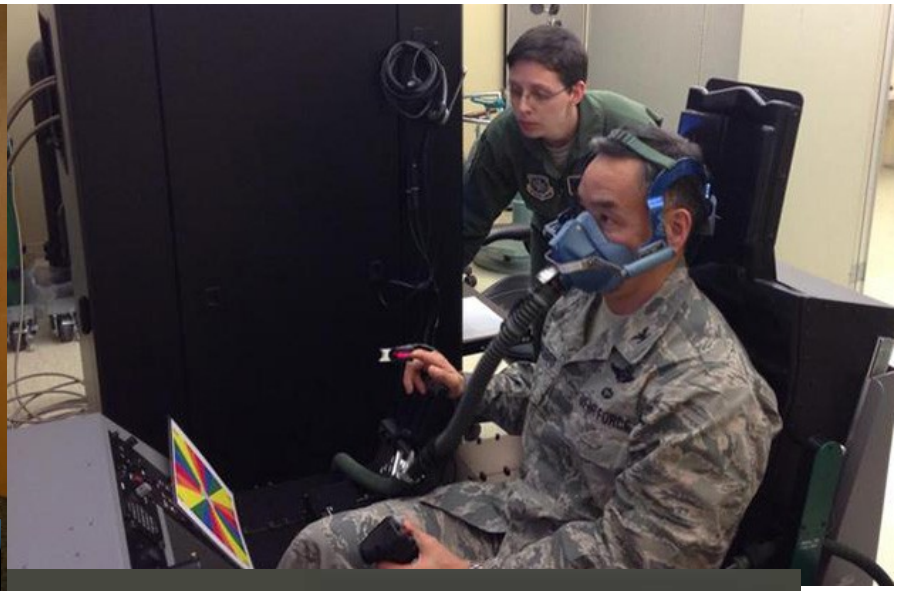
Material Investigation Roadmap


Hypoxia Event
Part "A" Initiated by HP.
Part "A" Submitted to PET and FSTs.
Part "B" Initiated by Maintenance.
Part "B" Submitted to PET and FSTs.
Part "C" Initiated by Flight Surgeon.
Part "C" and Blood Work submitted by Flight Surgeon to Medical for work up. Part "C" to Safety Center Physiologist
Aircraft Down for Troubleshooting to Determine what Components Needed to be Called in for EI, Based on Information Contained in Parts "A" and "B".
Quality Assurance Initiates HAZREP and JDRS Report.
The Following Represents the Life Support Equipment and OBOGS System Component Work Flow Process of Events Only. Other ECS/Pressurization/PTMS Systems/Sub-Systems Components Follow a Similar Work Flow Process During the Engineering Investigative Process.
Maintenance starts troubleshooting OBOGS or LOX delivery/ECS/Pressurization/PTMS.
Yes/No
If OBOGS System is suspect, JDRS GO/NO GO Response Initiated by FST.
If OBOGS System is NOT Suspect, Components Forwarded for Local Test and Check.
If OBOGS System is Suspect, Components Shipped to FST Via JDRS for Investigation.
OBOGS Suspect Components Received by FST Via Naval Supply System.
OBOGS System Components put through Receiving Inspection for Material Condition.
OBOGS Concentrator Sent to the Gas and Flow Laboratory for Swab Samples of Inlet and Outlet Fittings. Also, Gas Sample is Taken and Analyzed Using a Fourier Infra-Red Spectrometer (FTIR).
Initial Findings Drafted.
If Needed, Tech Dialogs are Initiated if Additional Information is Needed.
Mask, Hoses and Regulator Tested and Checked and Thoroughly Inspected. All Defects Noted.
Concentrator Run using "I" Level TTU-518A/E or TTU-452A/E Test Set.
Initial Findings Drafted.
Concentrator, Mask, Hoses and Regulator Sent to Altitude Laboratory for Dynamic Altitude and Sinusoidal Breathing Rates (BPM/LPM) Performance Based on Information from Parts "A" and "B" and also Aircraft Memory Unit (MU) Data if Received.
Initial Findings Drafted.
OBOGS Concentrator is Disassembled and Inspected for Material Condition. Sieve Beds and Inlet Filter Removed and Forwarded to the Gas and Fluid Flow Laboratory for Analysis.
Sieve Beds are Activity Tested using Laboratory Grade N2 and O2 with Instrumentation.
Sieve Beds are Opened and Inlet Filter are Sectioned, Sieve Beds lids are Swabbed and Multiple Sieve Samples are Analyzed Using a Gas Chromatograph Mass Spectrometer.
Additional Sieve Samples and Filters are Saved for Further Analysis by Independent Labs.
Initial Findings Drafted.
OBOGS Concentrator is Reassembled or Scrapped.
All Findings and Reports from all of the Testing and Investigative Processes are Compiled, Verified and Documented in JDRS Reports.
All Received OBOGS Concentrator and O2 Monitor is Shipped to OEM Manufacturer for Rework.
All Other LS Gear is Shipped to Reporting Command.
JDRS Report Finalized and Submitted and Closed.
Engineering Investigation Complete.

PET Event EI Process

- All components are visually inspected & functionally tested separately
- Concentrator supply O2 is run across an IR Spectrometer for CO detection/contamination
- Concentrator is run on TTU-518
- Entire system is tested in altitude chambers with reported altitudes & @ various LPM/BPM with breathing machines depending on information gathered in HAZREP
- All discrepant items are root cause analyzed (autopsy)
- All finding are then reported via JDRS

ROBD Training



Challenges

1. Spatial Disorientation and CFIT Mitigation

2. Fatigue Operations

3. Hypoxia and Decompression Sickness

4. Vibration, Neck, Back Pain and Injury

5. G-Induced Loss of Consciousness prevention
6. Unmanned Aircraft Systems MPT&E
7. Motion Sickness

8. Vision Enhancement and Protection

   a. Refractive Eye Surgery